Development of Paver Block Containing Recycled Plastic

ABSTRACT

Disposal of accumulated plastic waste daily is an exigent in solid waste management. Hence, this study investigated the possibility of utilizing plastics waste in paver block fabrication for the pedestrian walkway. The development of paver block containing recycled plastic was started with a trial mix in order to identify the appropriate method for paver block fabrication. Two methods which are heating and compression were observed during the trial mix before proceeding to full scale casting. Compression method was selected in the production of paver block for further test. There were two ratios of cement, sand and soil used in the design mix namely mixture A and mixture B. The plastic content used in each mix were 0%, 5%, 10%, 15%, 20%, 25% and 30% by weight of sand. Laboratory tests conducted on the specimen were compressive strength, water absorption and skid resistance. Both mixtures were compared in terms of compressive strength in order to select the appropriate ratio. The results showed that mixture B produced higher compressive strength compared to mixture A. Replacement of 5% recycled plastic exhibits the highest compressive strength for mixture B, however for economical consideration the replacement can be utilized up to 30% recycled plastic content. Based on the water absorption test, the recycled plastic increases the water absorption. However, the skid resistance of the paver block was found higher than the requirements. Therefore, paver block made of recycled plastic incorporating locally available material has the potential for use in the construction of pedestrian path.